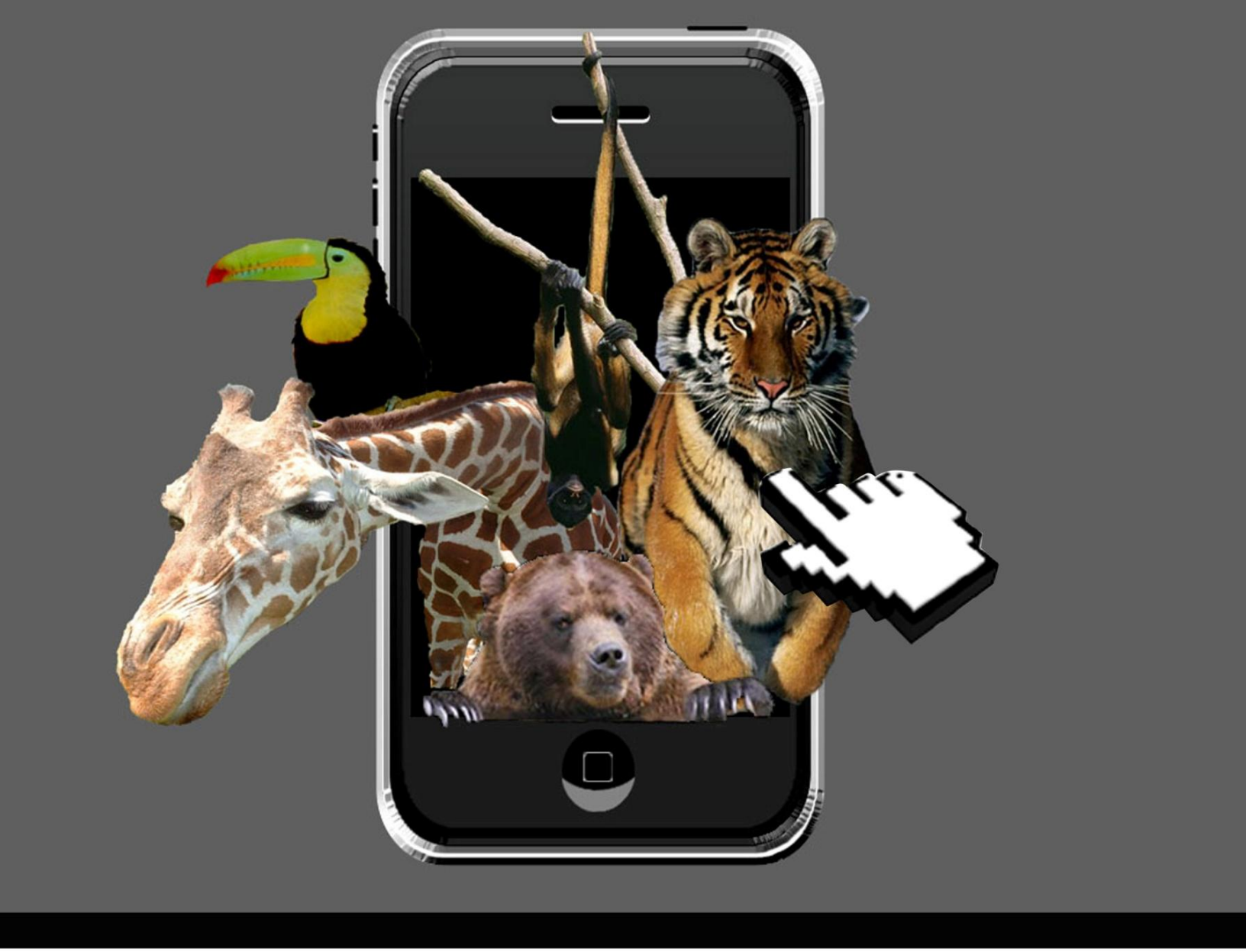

Project Sponsor: Brookfield Zoo
Faculty Advisors: Cindy & Dennis Hood

Anthony Alesia
Taylor Dreher
Romit Girdhar
Albert Hutchful
Matthew Miller
Natalie Szulyk
Qiaoqiao Chen
David Dziuba
Suliman Ibrahim
Justo Moraga
Adam Winterbauer
Aya Eid
Jiang Lan
Jianqi Xing
Mitsuru Chiba
Jennifer Puzewski

BROOKFIELD ZOO
Chicago Zoological Society
Inspiring Conservation Leadership

ILLINOIS INSTITUTE OF TECHNOLOGY

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Table of Contents

I. Abstract

The members of IPRO 318 are teaming up with the Brookfield Zoo to develop an iPhone application which will enhance the visitors' experience and interactions with the Zoo environment. This educational module will be broken down into two major components. First, the Zoo education staff and animal researchers need help in developing a guided inquiry process that will assist users in identifying animals. By organizing the hierarchical structure of information provided by the Zoo, and coupling this with the tools available on the iPhone, IPRO 318 seeks to design an efficient, educational, and entertaining means of utilizing modern technology to identify animals in the Zoo and beyond.

The second portion of this project will incorporate animal identification capabilities into an all inclusive iPhone application which will further enhance the users' experience. This will include compiling and organizing information on the Zoo exhibits, dining, souvenirs, restrooms, and even assisting the user to locate the car when leaving, into a logical and attractive user-friendly layout. Additionally, this portion will further the educational component of this application with a variety of games which will not only teach the user but also involve the user in a deeper interaction with the Zoo and all of its resources.

This document will provide a detailed overview of the project, including specifics on each team member, project goals, background information, and a breakdown of necessary requirements for the organized completion of this project.

II. Team Information

Overall Team Purpose

The purpose of this IPRO is to build an iPhone application that enhances the user experience when visiting the Brookfield Zoo through guided inquiry. This application will be used to educate the user about conservation and animal classification.

Team Objectives

The primary objective of this team is to develop an application for the Brookfield Zoo that is ready for submission to Apple's Application Store. This application will give the customer a map of the Zoo to allow for more efficient trip planning and will include various other features to enhance the user experience. Additionally, the application will use guided inquiry to aid in animal identification.

The IPRO will be broken down into four separate teams:

TEAM iCAP:

Team Leader	Justo Moraga
Team Members	Anthony Alesia, Qiaoqiao Chen, Romit Girdhar
Team Purpose	Develop an application for the iPhone with fundamental capabilities to enhance the user/visitor experience at Brookfield Zoo
Team Objectives	• Develop the iPhone application interface and content to help utilize its capabilities, such as a home page, map page, zoo information page, etc. • Implement a map within the iPhone application that features a live compass, a current location indicator, and a trip planner • Implement other teams' ideas into the app.

TEAM GI:

Team Leader	Aya Eid
Team Members	Albert Hutchful, Suliman Ibrahim, Mitsuru Chiba
Team Purpose	Organize and prioritize information on both animals and users needs
General Objectives	• Organize the desired applet features/capabilities into a logical hierarchy for presentation to the user • Organize and design the guided inquiry structure and questions used to classify each animal in the Zoo

TEAM ZOO EXPERIENCE:

Team Leader	Adam Winterbauer
Team Members	Taylor Dreher, Matthew Miller, Natalie Szulyk, Jianqi Xing
Team Purpose	To focus on the needs and wants of the user as well as mediating between Brookfield Zoo and the IPRO.
General Objectives	• Gather and prioritize any needed information for the other teams. This includes communicating with representatives from Brookfield Zoo and relaying requests for information • Assessing surveys previously conducted by the zoo to determine visitor's interests, and conducting our own surveys to further aid in the development of an interesting and educational application • Provide feedback in the capacity of user representatives to insure a user-friendly application

TEAM UI:

Team Leader	Jennifer Puzewski
Team Members	David Dziuba, Jiang Lan
Team Purpose	To use the team's background in design to interpret ideas into visual form.
General Objectives	• Create an application Icon • UI Design (Page Layout) • Miscellaneous Design (games/puzzle design) • Presentations materials for midterm and IPRO day • Develop an animation to market the new application design

III. Background

Partner information

Our partner is the Brookfield Zoo & Chicago Zoological Society (CZS); they are looking to develop an iPhone application which will utilize a guided inquiry classification system. The application will fit in with the CZS Mission statement, which seeks to educate users about conservation by creating a connection between visitors and the animals. The following information is quoted Dennis A. Merrit, Jr. which includes the main history of Brookfield Zoo:

> By June 30, 1934, when the Brookfield Zoo officially opened, local residents had been working to build it for almost 15 years. In 1919, Edith Rockefeller McCormick gave 83 acres of land to the Forest Preserve District of Cook County for a large modern zoo, and the district responded by adding another 98 acres. In 1920, a group of prominent Chicagoans joined to make the zoo a reality and, in 1921, incorporated the Chicago Zoological Society. The following year, building began and George Frederick Morse, Jr., was hired as the society's first manager. Not until 1926, after county residents approved a zoo tax, did serious construction begin, only to falter in the Great Depression. But by late in 1931 momentum had returned to building what would become America's first zoo with barless exhibits. Visitors from all over the Midwest came to visit the zoo and its most famous residents: Ziggy, a popular male elephant, and Su-Lin, the first giant panda in an American zoo and the first of three pandas at Brookfield. Its development interrupted by World War II, the zoo expanded in size and commitments in the decades following. A Veterinary Hospital (1952), a Children's Zoo (1953), and the famous central fountain (1954) were built. Zoo leadership took advantage of new media opportunities, including television, and formalized education programs. The first curator of research, George B. Rabb, was hired in 1956. Despite these innovations, the zoo struggled with deficits and a declining physical plant through much of the 1960s. Then, helped by a large bond issue from the Forest Preserve District, close attention to zoo governance and visitor

services, and Rabb's appointment as director in 1976, the zoo began to recreate itself as one of the nation's best, especially in its institutional commitment to international conservation and environmental awareness. Tropic World was born, one of the world's largest themed great ape enclosures. Olga the walrus became a household name as hundreds of Chicago-area residents came to see her antics. The focus of the zoo turned dramatically toward people: visitors and those who would ensure its viability in the future. The Seven Seas Panorama was built and improvements were made to the Aquatic Bird House. Conservation biology became an important focus of the institution, as Rabb became chair of the Species Survival Commission for the International Union for the Conservation of Nature. Facility and staff changes helped to reinforce Brookfield's leadership position in this important arena. More recent exhibits promote conservation education. Visitors are encouraged to observe and enjoy the animals in realistic natural settings. Brookfield has continually pioneered new zoo experiences that point the way for other institutions. The zoo is still owned by the Forest Preserve District of Cook County and managed by the Chicago Zoological Society. With an animal collection numbering about 450 species and 3,100 specimens, attendance in 1998 was 2,200,000 (Merrit, 2004).

Need

There are a multiple of possible users that could be targeted in this IPRO project, but our primary users are CZS visitors. One of the main problems that we face in developing this guided inquiry classification application is the efficiency & accuracy of the system when it comes to how many inputs are needed for an accurate output. The other major user concern is the balance of or integration of user interaction to optimize efficiency & accuracy of the system.

Precedents

This semester, spring 2010, is the first time this project/idea is an IPRO (IPRO 318) but it started in the summer of 2009 when Prof. Hood ran a class to develop an iPhone application for animal classification for the Brookfield Zoo & Chicago Zoological Society (CZS). The project yielded two applications; one was a GPS enabled database and the other was a guided game. This project was successful in tackling some of the animal classifications and guided inquiry issues. This Previous attempt has laid a good foundation for continued inquiry/development. Three other precedents that are outside Illinois Institute of Technology are Woodland Park Zoo App, Houston Zoo App and Memphis Zoo App all developed by AVAI mobile solutions (for more information, visit http://avaimobile.com).

The three of these applications more or less have the same functions and features, which include the following:

1. GPS Enabled Map function: displays your location on zoo map
2. Near Me function: displays what is near your current GPS location
3. Today function: displays what's going on "today" in the zoo
4. Live Twitter Stream function: streams tweets about the zoo
5. Animal function: has information about animals
6. More function: has more info about zoo parking etc.

Other precedents are not specifically Zoo applications but have possible cross parallels to our project in terms of user experience, technology, etc. The number of precedents in this category could be in the thousands depending on the scope; two possible precedents are the iBird application and Shazam. The iBird is a great precedent to enhancing the user experience in a classification format. The iBird App is a bird classification application that has a very high level of user interaction (for more information, visit http://ibird.com). In addition, the Shazam application is a great precedent for the technology we may be implementing. Shazam is a music classification app that utilizes sound recognition to identify the song you are listening to (for more information, visit shazam.com).

Problems and Technology

One of the main problems that we are facing is that of the users focusing more on the iPhone than the animals and the Zoo. However, the main goal of this project is to enhance the experience of the real world with the help of virtual tools. Hence, it is important for the users to understand and appreciate the animals and the Zoo more than the application itself.

We also have to try and make the application as simple as possible so that it can be easily accessed and used by anyone and everyone. To make this possible, we are making use of the latest technologies that are at our disposal, while at the same time keeping some space for future improvements. The different technologies to be used include an accelerometer which measures proper acceleration, Global Positioning System (GPS) which can help us in navigating the map of the Zoo, and programming languages such as 'Objective-C', 'Xcode' and 'Interface Builder'. We also plan on implementing Augmented Reality and sound recognition in our application. A Combination of all these technologies along with extraordinary team work promises the users a zoo experience worth remembering for a long time.

Ethical and Social Considerations

Privacy concerns are the biggest source of ethical issues for this project. The content included in our application and the information that users could access is provided by the Zoo; we need to communicate with Brookfield Zoo to make sure that their privacy is protected.

We also need to consider that some users may share their experiences at the Zoo with the external world via internet; users may share information or photos that are protected by the Zoo. In order to avoid this situation, we should include privacy contract in the application that users must agree to before using the application.

Additionally, when conducting surveys and designing the application, we should respect the users and try not to offend them. Our application should also contribute something useful for society. The application should evoke public concern for animals, ecosystem protection, and other conservation efforts. Another major ethical issue that will be involved in this IPRO is user privacy. This includes how we are going to utilize, store, and gather information for this application.

Business or Societal Costs

The possible business or societal cost of the problems we will be tackling could be far reaching, but for this particular IPRO we will address the problems and respected costs related to CZS Mission which is " ...to inspire conservation leadership by connecting people with wildlife and nature".

IV. Statement of Values

All group members participating in IPRO 318 acknowledge and agree to adhere to the following principles of professional and ethical conduct:

- To complete their assigned tasks in a timely and earnest manner and trust in their teammates to do likewise.
- To seek help and/or clarification when needed to understand what is required of them.
- To remain informed of all topics and important issues addressed by the group.
- To treat each of the group members with courtesy and respect as dictated by professional standards.
- To communicate clearly and effectively when sharing information with the group.
- To be present, attentive, and open-minded during group meetings so as to achieve maximal participation and comprehension.
- To resolve any grievances among group members quickly and peacefully, thereby maintaining focus on their primary objective.
- To provide/accept constructive criticism to/from other group members politely.

Conflict Resolution

As with any organization, the team members of IPRO 318 anticipate conflicts among the group. When a problem occurs the key solution is found by understanding the structure and organization of the problem. It requires a type of relational thinking and mental reorganization of the problem's elements to recognize how to the correct the situation. When we are faced with a recurring problem we must change how we think about the same aspect of a problem. Each problem we will be faced with will have different solutions.

For instance, a common issue which usually occurs in group work is an individual does not equally contribute to the group. When this would happen in the subgroup the team member who initially notices the problem will discuss the issue with the individual. If the team member finds the problem has not been fixed they will discuss the issue to their team leader. The team would discuss the reasons why this situation is occurring. Once the problem elements are established the team leader will discuss the issue with the individual and assign tasks to complete.

If the problems keep recurring with the particular individual, the team will have to rethink how to handle the situation differently and propose a new solution. If none of the solutions indicate positive results it would become clear the individual does not take the course seriously. As a last result the issue would be brought up to our IPRO professors, causing negative consequences to be effective immediately.

Arguing among team members is counterproductive and can compromise the respect shared among group members, as well as undermine the goals of the team. In order to effectively and peacefully resolve conflicts within the group, the members of IPRO 318 will:

- Address the problem, thereby creating awareness of the dilemma among the group members
- Discuss options in a courteous, professional manner to maintain good relations among the team
- Find a solution that best serves the interests of the group as a whole, and is in keeping with the team's goals.

By adhering to this systematic approach of conflict resolution, the team will ensure that its members are respectful of the ideas presented to the group and their teammates.

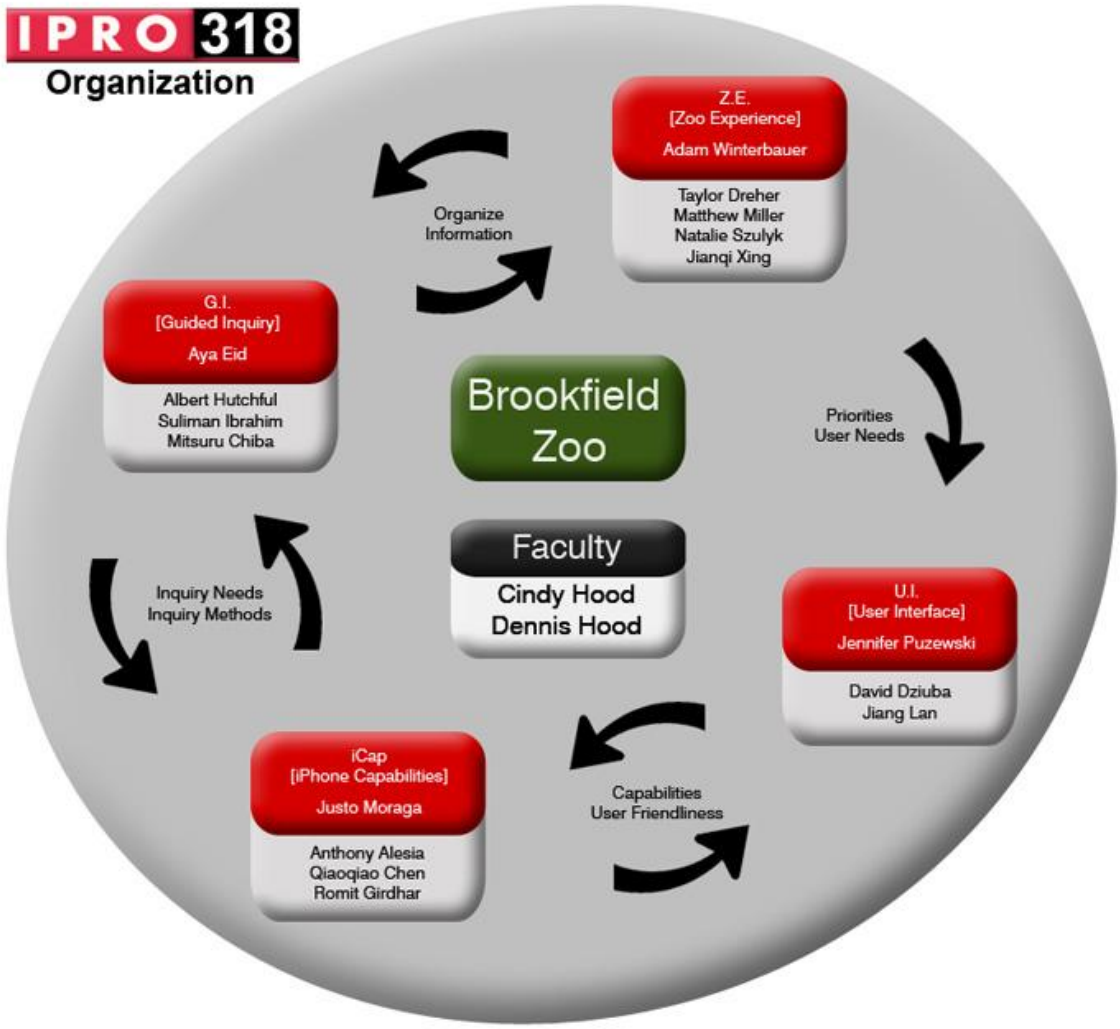
V. Work Break Down Structure

Problem Solving Process

A successful guided inquiry process for educational purpose needs a set of efficient and apposite questions for zoo visitors to participate and assists them for valid animal identification. Ideas for establishment of question set are merged by sub-teams

1. Development of the software is based upon old version created by previous project team. Programming sub-team is to augment new features to the tool in limited time, to meet zoo staff's requirements.
2. Sub-team accomplishes tasks on time and merges all accomplishments to deliverables and presents them successfully. Interactions and communications among each other are to deliver ideas.
3. Users focusing on iphone not animal or zoo experience

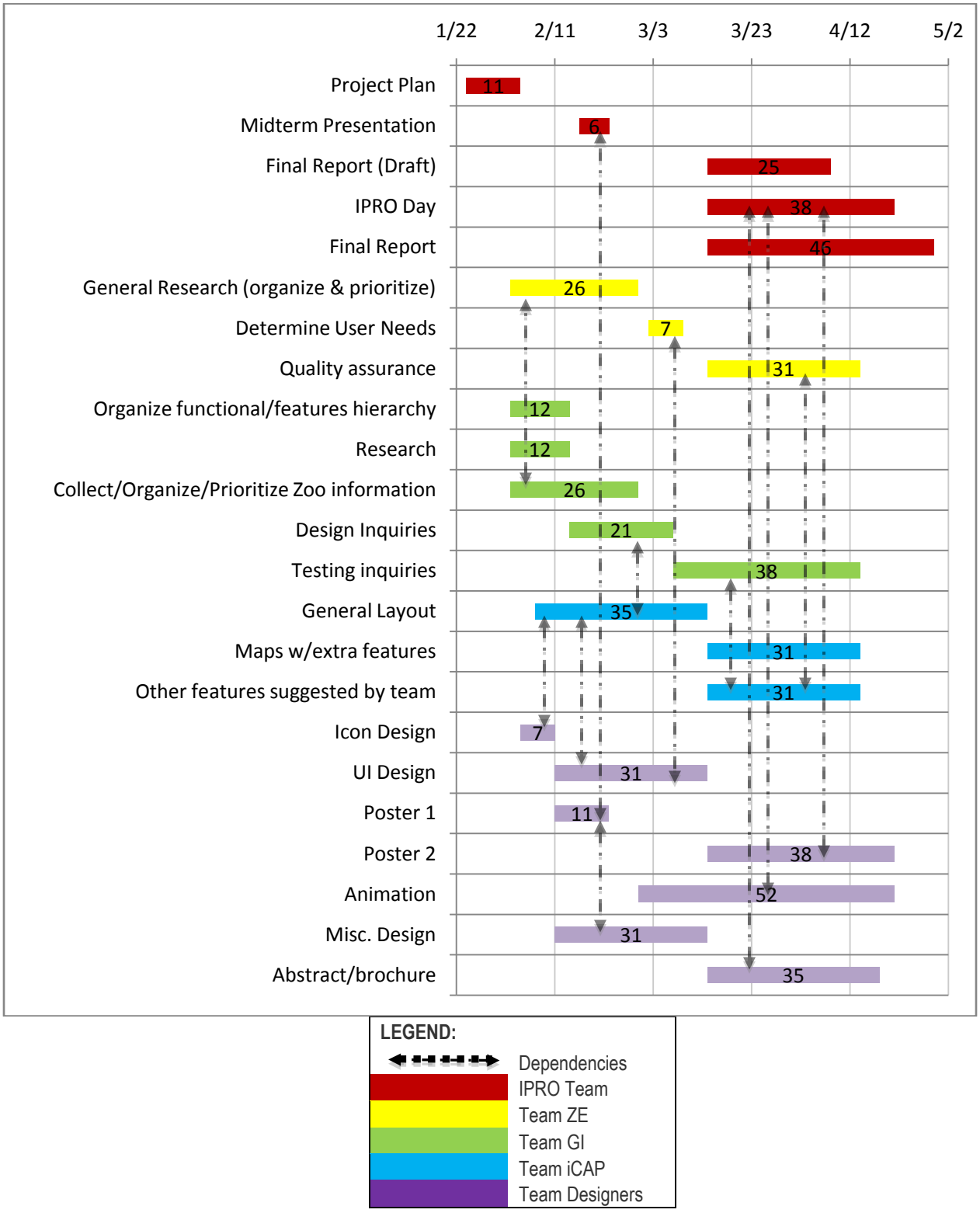
Team Structure



Gantt Chart

TASKS	Start Date	Duration (Days)	End Date
Project Plan	1/25/2010	11	2/5/2010
Midterm Presentation	2/17/2010	6	2/23/2010
Final Report (Draft)	3/15/2010	25	4/9/2010
IPRO Day	3/15/2010	38	4/22/2010
Final Report	3/15/2010	46	4/30/2010
ZE			
General Research (organize & prioritize)	2/3/2010	26	3/1/2010
Determine User Needs	3/3/2010	7	3/10/2010
Quality assurance	3/15/2010	31	4/15/2010
GI			
Organize functional/features hierarchy	2/3/2010	12	2/15/2010
Research	2/3/2010	12	2/15/2010
Collect/Organize/Prioritize Zoo information	2/3/2010	26	3/1/2010
Design Inquiries	2/15/2010	21	3/8/2010
Testing inquiries	3/8/2010	38	4/15/2010
iCap			
General Layout	2/8/2010	35	3/15/2010
Maps w/extra features	3/15/2010	31	4/15/2010
Other features suggested by team	3/15/2010	31	4/15/2010
UI			
Icon Design	2/5/2010	7	2/12/2010
UI Design	2/12/2010	31	3/15/2010
Poster 1	2/12/2010	11	2/23/2010
Poster 2	3/15/2010	38	4/22/2010
Animation	3/1/2010	52	4/22/2010
Misc. Design	2/12/2010	31	3/15/2010
Abstract/brochure	3/15/2010	35	4/19/2010

Gantt Chart continued...



VI. Expected Results

The main purpose of this project is to develop an interactive iPhone application that allows the user to identify Brookfield zoo animals based on their specific characteristics. This technology then can be later expanded and used as a foundation for future applications that encompass all animals no matter the location. This igroup will integrate multiple disciplines to produce a presentable working program, teaching all the members the value of working together and bringing specific knowledge to the group.

Team GI expects to come up with a system that will enable the differentiation of animals through a series of inquiries in an efficient and logical manner. The zoo environment team will attain valuable information on the structure of the zoo and its needs to ensure quality assurance. By writing the code for the application, team iCAP hopes to gain knowledge about iPhone programming and coding in general. They will also explore new technologies such augmented reality and sound recognition. User interface/design team will bring all the ideas to life, gaining insight into graphical interface systems and how to make them more appealing to target audiences.

Potential Obstacles to project success

- Programming and implementing features is limited by time.
- Limited knowledge of application creation and education will also cut the time available for implementation.
- Conflict in schedules may restrict meeting outside of the classroom
- People might not follow through with their responsibilities in a timely manner.
- Communication between sub groups
- Scope narrow defining

VII. Budget

Activity	Cost	Description
Transportation	$270	2 Metra weekend passes ($7 each) for 18 group members
Food	$310	Lunch at zoo for 18, assuming $8.50 per person, for 2 visits.
Posters	$70	Finishing costs for brochures/posters/final IPRO deliverables
Miscellaneous	$50	unforseen costs
Total	**$700**	

VIII. Designation of Roles

- **iGroups Moderator:** Anthony Alesia will organize igroup files and threads.
- **Agenda Maker:** Team Leaders will organize group discussions and assign tasks.
- **Minutes Taker:** Taylor Dreher will be responsible for preparing the minutes from all meetings.
- **Time Keeper:** Romit Girdhar will make sure class is carried out in an efficient manner, on topic

IX. IPRO 318 Roster

Team Member	Major	Availability	Contact
Alesia, Anthony	Computer Engineering	Thursday after 4:30pm, all day Friday - Sunday	aalesia@iit.edu
Qiaoqiao Chen	Computer Science	Monday-Thursday 3-5 p.m.	Qchen18@iit.edu
Mitsuru Chiba	Biology	Every day after 3:15 except Wednesday	mchiba@iit.edu, [redacted]
Taylor Dreher	Psychology	M after 4:30,T after 3:15, W after 4:30	taylordreher@gmail.com , tdreher@iit.edu: 847[redacted]
David Dziuba	Architecture	Mon/Wed mornings, Tues Evening (by appointment)	ddziuba@iit.edu [redacted]
Aya Eid	Biomedical and Electrical Engineering	Tuesday-Friday after 3:30pm, and all day S and Sun	aeid@iit.edu [redacted]
Romit Girdhar	Computer Science & Applied Mathematics	Monday & Wednesday - After 6.15pm, Tuesday: After 3.30pm	rgirdha1@iit.edu [redacted]
Albert Hutchful	Graduate(Information Tec. & Management)	Monday after 1pm, Friday all day	ahutchfu@iit.edu
Suliman Ibrahim	Biology	Tuesday-Thursday 11-1:50	sibrahil@iit.edu [redacted]
Jiang Lan	Computer Science	MTWR, after 3:15, F all morning and after 3:15, weekends	jlan@iit.edu
Matthew Miller	Architecture	M after 1:00pm, W after 1:00pm, F after 1:00pm	mmille22@gmail.com, mmille22@iit.edu[redacted]
Justo Moraga	Computer Engineering	T after 2:00 pm,W after 6:15 pm, Th & F anytime	justmoraga@gmail.com [redacted]
Jennifer Puzewski	Architecture	M/W before class, T 3-6pm, F possible, Sat after 5pm	jpuzewsk@iit.edu, [redacted]
Natalie Szulyk	Psychology	Mon, Wed, Thurs after 5pm Fr, Sat, Sun after 1pm	nszulyk@iit.edu [redacted]
Adam Winterbauer	Biochemistry	M, 12:40-6:00pm; R 3:15-6pm; F, all day; Weekends till 7:00pm	mcrugin88@gmail.com, awinterb@iit.edu [redacted]
Jianqi Xing	Computer Science Minor: Psychology	TR, 4:30-6pm; Weekends, all day till 4:00pm	jxing1@iit.edu [redacted]

X. Team Information-Skills and Expectations

Team Member	Strengths	Weaknesses	Applicable Knowledge	Skills to Develop	Expectations
Alesia, Anthony	Hardworking, dedicated, organized, adaptive	I sometimes focus too hard on a single problem.	Beginner's knowledge of Xcode and Interface Builder for developing	Better understanding of iPhone application development	Have a workable V1.0 application ready for submission to the App Store
Qiaoqiao Chen	Object oriented-programming	Talking	Data-Base design, application, implementation	iPhone application development, communication with others	Add new features to previous design, gain experience working with others and communication
Mitsuru Chiba	Research and design	Speech	Biology, structure and daily activities of Brookfield Zoo, Contacts with personnel	People Skills	Cooperative thinking and Effective solution to challenge
Taylor Dreher	research, writing, keeping people on topic, organization, I don't procrastinate	I get frustrated easily, I'm impatient	Research, Organizing	Team work, communication, public speaking	Work together, to develop an iPhone ap that we can present on IPRO day, but still leave room for improvement and growth with new technology
David Dziuba	Graphic design, Movies, 3D modeling	Poor writer	Basic understanding of programming, have designed websites in the past	Not Sure	Want to see how software development is done and learn how to prepare graphics for software developed by a separate team and work together
Aya Eid	Efficient, good communication, enthusiastic, motivation, realistic, works well with others	Impatient, when I am unprepared, public speaking puts me into a panic, procrastinate, dominate discussions	I know some things about some things	Patience, Compromise	Gel together, make this applet, have all the capabilities we hope for in a logical, cohesive, educational manner
Romit Girdhar	Always willing to learn new things, public discussion, debugging code	I'm too patient, I'm not that good at writing formal documents	Java, things related to Mathematics	Writing Skills, become a bit impatient	Work in group and finish this application along with learning new things like how to make an iPhone app and how to work more efficiently in a group
Albert Hutchful	Analytics	Communication	Information Technology (Guided Inquiry Architecture)	Effective communication	Work effectively with team members
Suliman Ibrahim	Biological knowledge	Presenting	Biological knowledge, animal classification	Presentation and Team Work	Team work and communication skills

Jiang Lan	Research, creativity, design, programming, photography	Communication, writing	Planar design, programming	Communication skills, procedure of design	UI design and application
Matthew Miller	Design, creative, problem solving, patient	Procrastinate, unmotivated at times	Communication, management, teamwork	Design	Develop a iPhone ap and become familiar with its capability's and shortcomings
Justo Moraga	Well-rounded, adaptive to changing environments, Excellent organizational and planning skills, communication and working with others	Too much attention to detail, Lack experience in programming, Speaking and getting my point across	Some fundamental knowledge with Java and Introduction to XCode and the iPhone SDK, Adobe Photoshop and Flash	Expand my understanding of the iPhone SDK and its programming aspects, Enhance my skills in communicating and working with others	To develop and release a beta version of the very first Brookfield Zoo iPhone App
Jennifer Puzewski	Design, good communicator /mediator, team player, very positive, good problem solver, organizing	Do not know programming, not very flexible	Organizational skills, communication, Design	Working with a large group in an efficient and productive manner	Create a final product which may not be an actual application but a good model for future development for students or for the zoo
Natalie Szulyk	Meeting deadlines, writing, organized, responsible, improvising	Presentations (I say um a lot), impatient,	Psychology subjects	Working in groups	Work together well as a team and complete the application
Adam Winterbauer	Research, writing, creativity, organization, communication	Limited computer skills (programming, Photoshop)	Taking class for designing applications	Leadership, public speaking	Apply previous IPRO experience and enthusiasm to aid in the creation of a viable new iPhone application, and to effectively lead my sub-team
Jianqi Xing	Research, creativity, organization, communication	Schedule skills, language skills	Computers	Schedule skills, HCI-project development, leadership	Gain more knowledge on how to design an application based on user desire, develop HCI-project experience.

References

Merrit, Dennis. “Brookfield Zoo (Chicago Zoological Park)” Encyclopedia of Chicago. 2004. Newberry Library. 4 Feb. 2010. <http://www.encyclopedia.chicagohistory.org/pages/172.html>